The role of life-cycle-assessments for biodegradable products: bags and loose fills

Bea Schwarzwälder*[a], Luigi Marini[b]
[a]Composto Bio-Consulting, Gheidweg 24, CH-4600 Olten, Switzerland
Fax 0041 62 213 93 75; mail@composto.ch
[b]Novamont SpA

Purpose of the work

Internal use: LCAs are very good means to find the expensive and relevant steps in the production process of the focussed products. Improving the most relevant steps gains most money and is most advantageous for the environmental management system of the enterprise.

External use: LCA studies are used for public relations as well as selling arguments. An increasing number of customers care about the environmental engagement of the bidders. Studies calculated according to ISO 14040 guarantee high quality.

Approach

The ISO 14040 and the enclosed external critical review guarantee the transparency and the reproduction of a LCA study.
Biodegradable bags for organic waste collection: Biodegradable bags made out of Mater-Bi were compared to paper and PE bags. The life cycle considers all steps from the raw material until the waste processing in a composting facility (Mater-Bi and paper bag) and the incineration (PE bag). The models CML and Eco-Indicator 95 were used, however every category was assessed separately. The Mater-Bi bag turned out to be ecologically less harmful than the paper bag and the PE bag on condition that 10% of organic waste go to the incineration together with the PE bags.
Biodegradable loose fills: Mater-Bi loose fills were compared with EPS loose fills, considering the whole life cycle from raw material until waste management in the incineration (EPS), the composting facility and waste water treatments (Mater-Bi). A total of 13 weighting categories of the 2 models CML and Eco-Indicator 95 were used. Mater-Bi loose fills turned out to be slightly more advantageous for environment than EPS loose fills. However, the emissions caused by transportation of loose fills are enormous. Production of loose fills at the customer's place or directly from the raw material is of less environmental damage, due to saved transports.

Innovation and relevance

The study of the Mater-Bi bags was the first LCA on bioplastics to be calculated according to ISO 14040 including an external critical review.
A good database on agriculture, renewable resources and bioplastics is available for further studies.

Conclusions

LCA studies are of increasing importance for biodegradable products: to improve production process, for external communication, for politics. International norms such as ISO 14040, available database of and special software tools guarantee a high quality and decreasing costs of the calculations.